

Introduction to AWS

11-695 Recitation 1



Agenda

EC2 Storage Architecture

Launch Instances

Connect to Instances

Useful Tools

What is AWS?

Amazon Web Services, includes

Compute (EC2), Storage (S3), Database (Aurora, DynamoDB), ...

Amazon Elastic Compute Cloud (EC2) provides virtual machines

... some with GPUs (main reason to use EC2)

Agenda

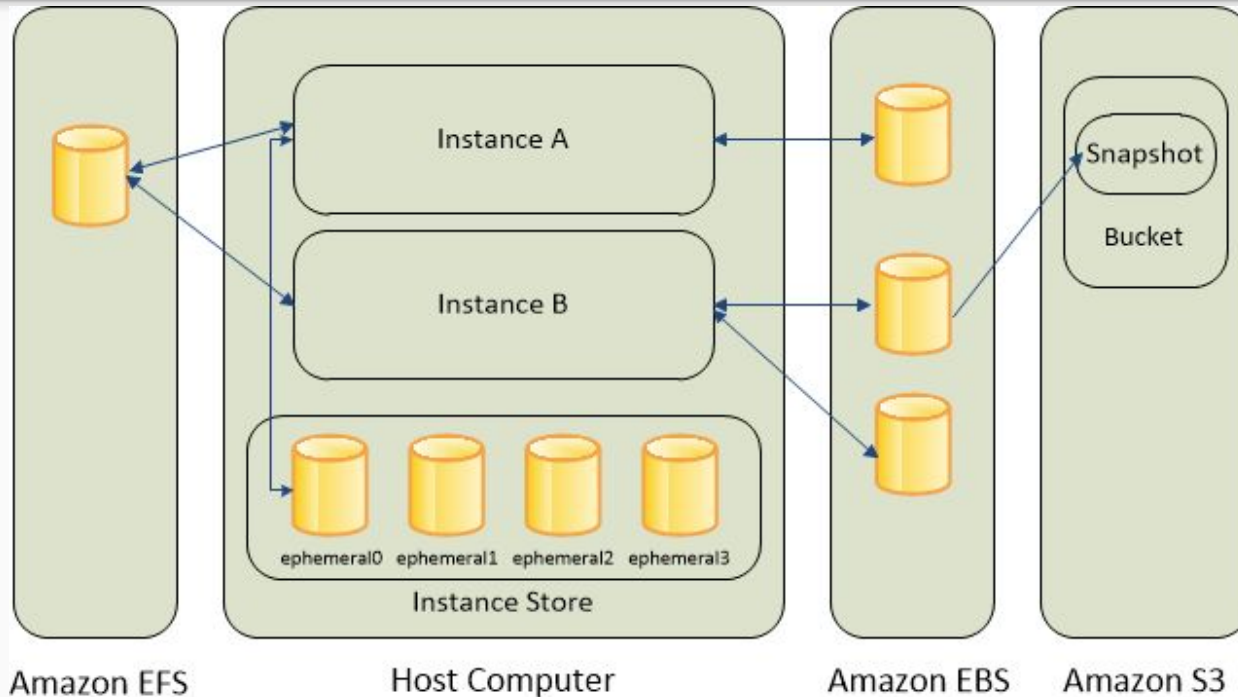
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EC2 Storage Architecture



<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/Storage.html>

EC2 Storage Architecture

Amazon EC2 Instance Store: Instance stores are storage volumes that are present on the host computer that the instances are running on. Instance stores are temporary (ephemeral), block level storage. Instance store data is cleared when an instance is stopped or terminated.

Amazon Elastic Block Store (EBS): EBS presents volumes to the user that can be created independently of an instance and attached to instances as needed. EBS volumes are persistent and flexible. Multiple EBS volumes can be attached to an instance, and an EBS volume can be detached from an instance and attached to another. EBS incurs additional charges (GB/month) in addition to the EC2 instance charges. EBS volumes can also be backed up by creating a snapshot, which is stored in Amazon S3.

Amazon Simple Storage Service (S3): Amazon S3 is an object storage service which has a web services interface to store and retrieve data. Instances can access data directly on S3 using the web services interface. Amazon S3 is also used to store snapshots of EBS volumes.

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Before Launching Instances ...

1. Sign up an AWS account, login to AWS Management console
2. Go to Services -> Billing, setup Billing Info, Redeem Credits
3. Go to Services -> EC2, where you can launch instances, check pricing history, manage key pairs, security groups ...

Launch Instances

1. In EC2 console, select Launch Instance
2. Choose an Amazon Machine Image (AMI)
(Recommend) Deep Learning AMI (Ubuntu)
3. Choose Instance Type: p2.xlarge (\$0.9/hr), p3.2xlarge (\$3.0/hr)
On-Demand (won't be preempted) vs Spot ($\frac{1}{3}$ price, may be preempted)
4. Choose Storage (uncheck "Delete on Termination" for spot instances)
5. Tags and security groups
6. Launch -> Generate/Select key pair for ssh

Tips

Filter GPU types:

The screenshot shows the AWS console interface for selecting an instance type. The navigation bar includes the AWS logo, 'Services', and 'Resource Groups'. The progress indicator shows four steps: '1. Choose AMI', '2. Choose Instance Type' (underlined), '3. Configure Instance', and '4. Add Storage'. The main heading is 'Step 2: Choose an Instance Type', followed by a descriptive paragraph about Amazon EC2 instance types and a 'Learn more' link. Below the heading, there are filter controls: 'Filter by:' with a dropdown menu set to 'All instance types', a 'Current generation' dropdown, and a 'Show/Hide C' link. A table of instance types is partially visible, with a dropdown menu overlaid on it. The dropdown menu lists various instance categories, with 'GPU instances' highlighted in orange. The table rows show instance types: t2.nano, t2.micro (with a green 'Free tier eligible' badge), and t2.small.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases and resources for your applications. [Learn more](#) about instance types and how they can be used.

Filter by: All instance types Current generation Show/Hide C

Currently selected	Type
<input type="checkbox"/>	t2.nano
<input type="checkbox"/>	t2.micro Free tier eligible
<input type="checkbox"/>	t2.small

Tips

Configure Spot request:

Maximum price:

On-Demand or higher

Other fields:

Default config

1. Choose AMI 2. Choose Instance Type **3. Configure Instance** 4. Add Storage

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from

Number of instances ⓘ La

Purchasing option ⓘ Request Spot instances

Current price ⓘ

Availability Zone	Current price
us-west-2a	\$0.270
us-west-2b	\$0.270
us-west-2c	\$0.270

Maximum price ⓘ \$

Persistent request ⓘ Persistent request

Tips

SSH

HTTP

e.g. Jupyter Notebook

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags **6. Configure**

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules for a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: Create a **new** security group
 Select an **existing** security group

Security group name:

Description:

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ
<input type="text" value="SSH"/>	<input type="text" value="TCP"/>	<input type="text" value="22"/>	<input type="text" value="My IP"/>
<input type="text" value="HTTP"/>	<input type="text" value="TCP"/>	<input type="text" value="80"/>	<input type="text" value="My IP"/>

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On local machine:

```
ssh -i key_file.pem ubuntu@ec2-50-19-54-72-compute-1.amazonaws.com
```

... Remember to change your local secret key file permission to 400.

```
chmod 400 key_file_name.pem
```

Attach existing EBS and mount

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-attaching-volume.html>

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-using-volumes.html>

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Useful Tools

Tmux - Maintain active terminals on remote machines

Jupyter Notebook - Coding python in local browser and running on remote machines

FileZilla - Transfer files between local and remote machines

Thanks!

Questions are welcomed
on Piazza!